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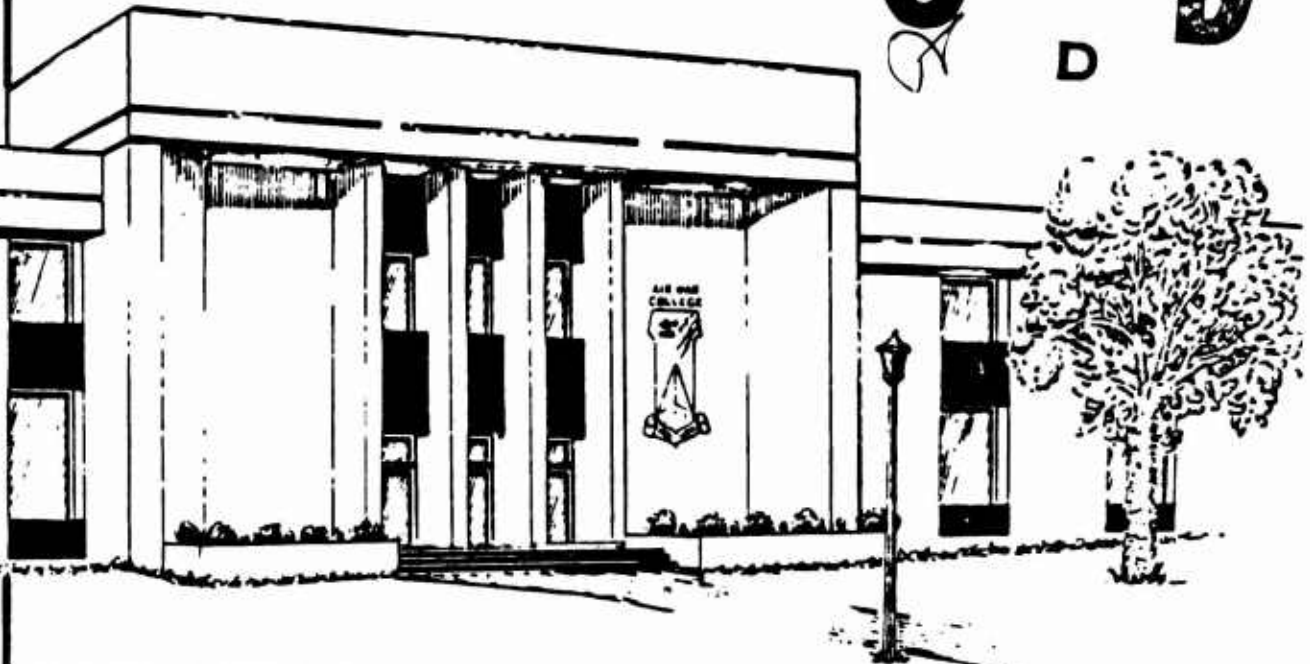
## RESEARCH REPORT

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REQUIREMENT FOR A LIGHT COMBAT HELICOPTER

By LT COL BILLY J. MILLER, USA

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MAXWELL AIR FORCE BASE, ALABAMA

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REQUIREMENT FOR A LIGHT COMBAT HELICOPTER

by

BILLY J. MILLER  
Lieutenant Colonel, USA

A RESEARCH REPORT SUBMITTED TO THE FACULTY  
IN  
FULFILLMENT OF THE RESEARCH  
REQUIREMENT

Research Advisor: Lieutenant Colonel John G. Tockston

MAXWELL AIR FORCE BASE, ALABAMA

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## AIR WAR COLLEGE RESEARCH REPORT ABSTRACT

TITLE: Requirement for a Light Combat Helicopter

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Remarks on the requirement for a light combat helicopter (LCH) capable of multi-role missions as a scout-attack and utility helicopter in support of conventional light infantry forces in a low-intensity conflict environment requiring rapid deployment. The Army is pursuing a planned acquisition of an entire new family of light helicopters, the LHX, that is of high-tech design and capability, and will meet all Army requirements for a LCH well into the 21st Century. Initial fielding of the LHX is not expected before the mid-1990s. The thesis of the author is that technology and innovative ideas exist today that allow fielding of a limited number of near-term LCHs in the light divisions that constitute the US Army's conventional rapid deployment forces. Recent operations such as Grenada have demonstrated the validity of this need, today, for low-intensity situations involving rapid deployment of light forces into combat. Several experimental tests and evaluations using both current production Army helicopters and commercial versions have demonstrated the ability to produce a near-term, affordable LCH. Ideas drawn from these experiments along with suggestions from other authors on this subject are offered as possible solutions until the LHX is fielded.

## BIOGRAPHICAL SKETCH

Lieutenant Colonel Billy J. Miller (M.A., Appalachian State University) has been interested in the light combat helicopter concept since 1972 when he was first assigned to the air cavalry squadron in the 82d Airborne Division. He has served in numerous command and staff positions in air cavalry units including three separate tours with the one in the 82d Airborne. He served as squadron commander of that unit from 1982 to 1984 and participated in several training and real-world, no-notice deployments of combat aviation elements in support of light infantry operations. His most recent experience was the Grenada operation in 1983. His last assignment was as Inspector General, 82d Airborne Division. He is a graduate of the US Army Command and General Staff College. Lieutenant Colonel Miller is a graduate of the Air War College, Class of 1986.

## REQUIREMENT FOR A LIGHT COMBAT HELICOPTER

### INTRODUCTION

Since the Vietnam era, the doctrine, tactics, training and force structure of Army aviation has been focused on being able to operate in a mid-to high-threat battlefield environment and prosecute the heavy antiarmor battle. This focus on the most dangerous threat, the Warsaw Pact forces, brought an unparalleled emphasis on aircraft survivability. Coupled with this was the development of high technology systems to counter enemy air defense weapons along with a whole family of lethal, sophisticated antiarmor weapon systems.

While these systems are tremendous in their capability to attrit enemy forces and survive in the mid-to high-threat battlefield environment, they may be too sophisticated for conflict at the lower end of the spectrum where smaller, but more numerous weapon systems are needed and where versatility and adaptability are required. A major key to success in a low intensity conflict is rapid deployability, meaning light forces with light equipment. In the case of Army aviation, a light combat helicopter (LCH) is needed that can deploy with the initial ground forces and provide the combined arms effort that will ensure success in this battlefield environment.

Recent events such as Grenada and Lebanon have demonstrated that a low intensity type battlefield requiring

rapid deployment of light forces for short contingency operations is the most likely type of battlefield upon which US forces will be committed. Commanders and planners must be able to deploy the necessary force in the required time frame and sustain this force long enough to accomplish the mission. A 1984 Air Command and Staff College research report entitled "Light Combat Helicopter" by Major Michael L. Lovett described the LCH as follows:

The light combat helicopter is not simply an attack, a scout, or a command and control helicopter; it is a multi-role system that can be quickly tailored to perform specific functions for limited periods. Its capability for rapid deployment/employment provides a combat asset immediately available to commanders. A light combat helicopter has been needed since helicopters were first integrated into maneuver forces, but the need has not been satisfied because current systems have not provided the required flexibility for rapid deployment/employment or rapid systems reconfiguration. Recent developments in technology and innovative ideas have provided the key elements in LCH design. This helicopter is not likely to replace any existing aerial platforms, but it will complement these systems and resolve current deficiencies in the Army's combat mission. The Army needs this aircraft to satisfy two requirements: rapid deployment on Air Force tactical aircraft and rapid interchangeable systems configurations for varied missions. 1

#### HISTORY OF THE LIGHT COMBAT HELICOPTER

Tactical employment of helicopters by the US Army began during the Korean War, primarily as an aerial observation platform and medical evacuation vehicle. The first successful attempts to arm the helicopter was in 1956 when machine guns were mounted on an OH-13 observation

helicopter. These early experiments demonstrated the potential flexibility of the helicopter and provided the idea of equipping the helicopter for multi-role missions. These innovative ideas evolved during the 1960's into the versatile and potent combat weapon system the helicopter became in Vietnam. During the mid-1960's, the OH-13 was replaced by the OH-6A and OH-58A as the Army's observation helicopter and armed scout helicopter in the newly formed air cavalry units. The UH-1 became the workhorse in both the utility role and as a gunship helicopter. The armed helicopter concept led to the development of the AH-1G Cobra in 1967 as the Army's first single purpose attack helicopter. It was designed as an aerial weapon system to defeat lightly armored and relatively unsophisticated enemy defenses with rockets, machine gun and 20mm cannon fire, and provide close fire support for ground troops. In 1972, heavier air defense systems, radar directed guns and heat seeking missiles were employed against US helicopters in Vietnam. The 1973 Arab-Israeli War demonstrated the combined effect and lethality of antiarmor missiles, air defense missiles and radar directed air defense guns. Low level, nap-of-the-earth techniques and standoff tactics using terrain masking became the key to survival of the helicopter in this battlefield environment.

Army aviation met this challenge of the mid-to high-intensity environment with a new generation of precision guided munitions, night vision devices, target



acquisition systems, and a virtually all-new family of aircraft. The need for a light combat helicopter was quickly overshadowed by the requirement and acquisition of the AH-64 Apache attack helicopter and the UH-60 utility transport helicopter.

In 1980, the Army was tasked to provide a Rapid Deployment Force that could be tailored for a contingency operation and deploy on short notice to any place in the world. An Army aviation task force (battalion size), designed for rapid deployment, was formed and equipped with lightly armed OH-58C and OH-6A helicopters along with UH-60 Blackhawk and CH-47 Chinook helicopters, all of which were equipped with special adaptations for night operations, extended range fuel systems and long range navigation avionics. An upgraded version of the OH-6A, the Hughes 500MD, was later added to this unit. This highly versatile helicopter is adaptable to several armament systems, including the TOW anti-tank missile and FLIR Augmented Cobra Tow Sight (FACTS).

Army aviation units organic to light divisions such as the 101st Air Assault, 82d Airborne, and the 7th and 9th Light Infantry Divisions have experimented with various modifications and innovative ideas for adapting the OH-58A and C helicopter into a more rapidly deployable aircraft. There has been some success and units have requested authorization to modify existing aircraft or procure off-the-shelf, state-of-the-art light helicopters such as

the Hughes 500MD, in order to have rapid deployable aircraft available for both training and mission planning.

Other than approve limited testing and evaluation of LCH concepts, the Army has not acted favorably to these requests for a near-term (right now) LCH. Because of the procurement of the AH-64 Apache and the OH-58A conversion to the Advance Helicopter Improvement Program (AHIP), there has been a fear that funding quick fixes of existing aircraft or purchasing commercial versions might jeopardize the entire AHIP/AH-64 acquisition program. The Army is pressing for a fully capable light scout/attack and utility helicopter under a program known as the Light Helicopter Family (LHX). It is in the R&D stage with several aircraft manufacturers competing. The LHX program is currently funded in the Army budget and the aircraft should be in tactical aviation units in the mid-1990's.

#### LHX -- THE LCH ANSWER FOR THE FUTURE

The objective of the Light Helicopter Family (LHX) program is to provide the Army an affordable and conventional helicopter with all weather and night operation capabilities to replace the aging and obsolescent light fleet of OH-6, OH-58, UH-1 and AH-1 aircraft. 2 These aircraft have been the mainstay of the fleet, but are rapidly becoming obsolete and will require replacing. The LHX will be smaller than the UH-1 and AH-1, but slightly larger than the OH-58 and will have a mission gross weight between 6000

and 8000 pounds. Its design will be high technology and will be capable of performing the scout/attack missions in the version called the LHX-SCAT and the utility/observation mission in the version designated the LHX-U. This will be the major new helicopter system buy for the Army going into the 21st Century. A 1983 article in Interavia titled "LHX: The US Army Wants 5000" states that the total buy could be approximately 2000 LHX-U's, 1100 LHX-SCATs for attack and nearly 1800 LHX-U's for scouting. The Program Manager for the LHX states that the "planned procurement of 5,023 LHX aircraft represents the largest aircraft acquisition in the history of the Army." 3

The LHX will be compatible with the UH-60 and AH-64 and will be capable of self-deployment using external fuel pods like the Blackhawk and Apache.

For the long term, this is the solution to meet the US Army's light combat helicopter needs. The problem is the void that exists without a rapid deployable light combat helicopter until 1995 when the LHX is to be fielded. The US Army needs a LCH in its light divisions today that is capable of rapid deployment and employment in both the attack and scout role.

#### LCH -- THE ANSWER FOR TODAY

There is only one aviation organization in the US Army today that is organized and equipped for true rapid deployment with light combat helicopters. This unit is

totally committed to a special operations/counterterrorism role and is not normally available for conventional light infantry forces in most low intensity conflict situations requiring rapid, short notice deployment. Grenada was an excellent example of this.

The light infantry units need to train in peacetime with those elements that make up the combat task force, whether company, battalion or brigade size. It is essential for success in contingency operations involving light forces that all elements of the combat task force train together during peacetime exercises. To do otherwise is courting disaster on the battlefield. Commanders and planners, both air and ground, need the LCH operational in light divisions today so that tactics and standard operating procedures can be established to maximize the unique capabilities of each type of unit.

To support the light infantry division, the LCH needs to be small enough to allow at least two to be transported in a C-130 in a flyaway configuration. Offload at an unimproved, tactical airfield should take a maximum of five minutes and the helicopter should be capable of being mission ready in another 15 to 20 minutes. In short, the ground commander should be able to count on his LCHs ready for mission taskings within 30 minutes of arrival by C-130.

The LCH must have some attack capability with armament systems capable of attacking both point and area targets; it must have both a secure communications system and an

accurate navigation system; and it must have a passive night vision system.

There have been at least two large evaluations of the LCH concept using Army helicopters; the OH-6A and OH-58C, and a commercial candidate, the Hughes 500-MD. The first evaluation was in 1980 when the Light Helicopter (LCH) Fast Deployment Force Development Test and Experimentation (FDTE) was conducted. The second was known as the Light Air Cavalry Troop (LCAT) Concept Test in 1983. A detailed report of these tests was published by the US Army Aviation Board. The results of these tests are well covered by Major Lovett in his research report, Light Combat Helicopter. 4

The US Air Force was asked to test revised loading procedures for the modified OH-58C airframe that allowed the aircraft to be loaded in a flyaway configuration. The purpose was to determine if two of the modified helicopters could be loaded on a C-130 and six on a C-141 aircraft. 5 The helicopters were modified with adjustable skid tubes which allowed by means of a screw jack, the height of the helicopter to be reduced to within C-130 and C-141 cargo height without removal of the main rotor blade and mast assembly. The flyaway configuration calls for the main rotor blade to be folded back and supported by a blade support rack mounted on the tail boom. The vertical stabilizer is folded and the horizontal stabilizer is removed as required, depending on the load configuration. The lower wire strike protection system cutter is removed using quick disconnect

pins for quick reinstallation. In this flyaway configuration, two helicopters were validated for the C-130 and six for the C-141.

These simple and inexpensive modifications of the OH-58C observation/scout helicopter will allow commanders to integrate their entry directly into the battle area commensurate with airland operations; however, to be a true light combat helicopter capable of multi-role missions, the aircraft needs armament systems for self-protection and close support of ground forces. The ability to arm the OH-58C with 2.75 inch rockets, the M27E1 minigun system, the multi-purpose lightweight air-to-air Stinger missile system and the capability to fire an antitank guided missile system is all possible with current technology. Evaluations and studies of such capabilities for the OH-58C have been conducted by the US Army Armament R&D Command during evaluations of the Army's High Technology Light Division, the 9th Infantry Division.

An article in the May-June 1984 issue of the Army Research, Development and Acquisition Magazine, "The Light Cavalry Helicopter: A Management Approach" by LTC(P) Donald E.S. Merritt and CPT Warren T. Dudenbostel discusses these LCH possibilities using current technology on current production OH-58C scout helicopters. "In essence, we have a system that works, and will fit in any OH-58C, or other aircraft, that is state-of-the-art technology, readily

available, logistically supportable, and doesn't require a lot of development time before it can be fielded." 6

This article also provides a possible solution to the major drawback of adding additional equipment and systems to the OH-58C. The current production model does not have the power-to-weight ratio or gross weight capability to meet performance requirements as a LCH with these modifications. The needed capability could be gained by using the technology being applied in the Advanced Helicopter Improvement Program (AHIP), which is a conversion of existing obsolete OH-58As to the new OH-58D AHIP. The drive train used on the AHIP, the engine, improved tail rotor and four blade main rotor blade system could be utilized to increase the OH-58C's gross weight to 4500 pounds which would be sufficient to meet performance requirements. It should be noted that the Bell Helicopter Model 406 commercial helicopter utilizes many of these same components. "This could increase the logistical supportability of the AHIP and result in overall lower per unit cost for its components." 7

Other options for procuring a near-term LCH include procurement from countries or commercial helicopter companies that have aircraft meeting most of the LCH requirements. "Examples include the Hughes 530 MD, the Bell 406 Combat Scout, the British Army Aviation Corps' Westland Scout (AH-1), the Aerospatiale Gazelle (SA-341B), and the German Army's Messerschmitt-Bolkow-Blohm PAH-1 (BO-105P).

The British Army Gazell and Scout helicopters proved their effectiveness as multi-purpose LCHs during the Falkland Island campaign. The German BO-105P has also become a highly successful member of the German Army, proving its worth as a single attack and scout helicopter. These and other systems have proven that light combat helicopters are important elements of a viable combat force." 8

### CONCLUSION

Outside of the very limited and specialized special operations forces, "no current Army aircraft or organization is rapidly deployable to the extent required to support the light infantry division." 9 The LHX is in the future, at least ten years away from fielding in tactical units, assuming it survives the budget battles. The Army must have a light combat helicopter today to properly support the small, flexible and strategically deployable light division forces.

As Major Lovett concludes in his research paper,

The light combat helicopter can answer this shortfall. The light combat helicopter with its multi-role system can be quickly tailored to perform specific functions for limited periods. And its capability for rapid deployment/employment provides a combat asset immediately available to the light infantry division commander. An aviation brigade with a rapid deployment attack battalion formed with light combat helicopter companies and a divisional cavalry squadron with its light air cavalry troops can provide the light infantry division with an aviation capability that it requires--and it is available today. 10



The Army needs at least twelve LCHs in each of its light divisions, namely, the 82d Airborne and 101st Air Assault Divisions and the 7th and 9th Light Infantry Divisions. Aircraft already assigned to these units could be modified to meet the LCH requirements as previously discussed, or commercial versions to meet mission performance must be procured.

There are increasing attacks by Congress on DOD to cut major acquisition programs, and each service must look for ways to cut future expenses. Equipment procurement is one prime candidate. The military procurement cycle is time consuming (seven years from concept to fielding) and inefficient. Many state-of-the-art equipment designs are obsolete when actually fielded due to this long acquisition process for military items.

The September-October 1984 issue of the Army Research, Development and Acquisition Magazine discusses one solution to this situation in an article by Major Thomas A DeLuca, "NDI: Benefits of Using Commercial Equipment." "One solution to this problem is to procure commercially designed, readily available equipment, in lieu of costly military designed equipment. These commercial items, suitable for military use, are sometimes called non-developmental items (NDI). Non-developmental items can save both time and money for the military service." 11

The DOD program established to identify and procure commercial equipment for military use is the little known

Commercial Commodity Acquisition Program which has been around since 1977. As Major DeLuca concludes in his article, "the most urgent concern today should be to increase the awareness of the DOD acquisition community of the advantages of 'off-the-shelf' procurements. The Commercial Commodity Acquisition Program should pave the way to a clear and forceful DOD policy in the near future". 12

One other possible solution for obtaining a LCH in the near-term is to consider a leasing concept. This could be particularly attractive for helicopter companies that already provide light combat helicopters to other armies. The lease should be for five to ten years and include pilot training and maintenance support. The US Army must guard against a proliferation of more kinds of helicopters in its already varied fleet. And with LHX eventually coming on board as both a utility and scout/attack aircraft to compliment the Blackhawk and Apache helicopters, the Army does not need to be "stuck" with other, now obsolete, aircraft. The leasing concept could be modeled after the US Air Force lease of the commercial Learjet 35 A as its C-21 executive transport.

Again, this proposal for a near-term light combat helicopter should be considered for use in only the four most rapidly deployable US Army light infantry divisions. Whether it is a procurement of LCHs through commercial sources by lease or purchase, or a surrogate version of our existing aircraft modified to meet LCH requirements, the US

Army must place a light combat helicopter in the aviation brigades of its rapid deployable light divisions just as soon as possible. The capability as well as the need to do so exists today.

## NOTES

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